

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE															
DUAL SEAL WRIST BEARING, GLOVE SIDE, ITEM 106 (1) LEFT (1) RIGHT ----- 10088-02 (2)	3/1RA	106FM10Y External gas leakage (ball port or test port). Contamination, wear or deterioration of ball port plug or test port plug O-seal. Defective material; ball port or test port plug O-seal.	END ITEM: Gas leakage through test port or ball port seal. GFE INTERFACE: Opening of leakage path between ball race area and ambient. MISSION: No effect with single failure (loss of test port or ball port seal). With second failure (loss of primary seal) high O2 use. Abort EVA. CREW/VEHICLE: No effect with single failure (test port or ball port seal) or second failure (primary seal). Loss of crewperson with third failure (loss of SOP). TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate. REDUNDANCY SCREENS: A-FAIL	A. Design - The fluorosilicone O-seals mounted in the test port or ball port plug are in a static condition. Proper lead-in chamfers and radii on mating hardware components preclude damage to the O-seals during installation. The screws are fabricated from an AMS 5737 (A286) stainless steel and procured to A.N. specifications. Loss of the screws is precluded in design by adherence to standard engineering torque requirements for screw installations. B. Test - Component Acceptance Test: The wrist bearing is subjected to testing per Airlock ATP 10088 at Airlock with ILC source verification. During acceptance testing, a test port with the same size O-ring is utilized for pressure testing. No specific pressure test is conducted on the test port plug assembly. Certification: The dual seal wrist bearing successfully tested (manned) during SSA certification testing to duplicate operational usage (Ref. ILC Report 0111-711330). The following usage reflecting requirements of significance to the wrist bearing was documented during certification: <table border="1"> <thead> <tr> <th>Requirement</th> <th>S/AD</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>Rotation</td> <td>40224</td> <td>82000</td> </tr> <tr> <td>Engage/Disengage</td> <td>300</td> <td>1080</td> </tr> <tr> <td>Don/Doff</td> <td>98</td> <td>400</td> </tr> <tr> <td>Pressure Hours</td> <td>458</td> <td>916</td> </tr> </tbody> </table> C. Inspection - Components and material manufactured to ILC requirements at an approved supplier are documented from procurement through shipping by the supplier. ILC incoming receiving inspection verifies that the materials received are as identified in the procurement documents, that no damage has occurred during shipment and that supplier certification has been received which provides traceability information. The following MIP's are performed during the wrist bearing assembly manufacturing process to assure the failure cause is precluded from the fabricated item: <ol style="list-style-type: none"> 1. Verification of presence of ball port plug, test port plug and retainer screws. 2. Visual inspection of ball port and test port plug O-seal for gouges, nicks, tears and mold imperfections. During PDA, the following inspection points are performed at the glove assembly level in accordance with ILC Document 0111-70028 (4000 glove) or 0111-710112 (Phase VI glove): <ol style="list-style-type: none"> 1. Inspection for cleanliness to VC level. 2. Visual inspection for damage after proof-pressure test. 	Requirement	S/AD	Actual	Rotation	40224	82000	Engage/Disengage	300	1080	Don/Doff	98	400	Pressure Hours	458	916
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		106FM10Y	B-N/A C-PASS	D. Failure History - None. E. Ground Turnaround - None, however, every 4 years or 229 hours of manned pressurized time, the wrist bearing assembly is disassembled, cleaned, inspected, lubricated and reassembled. F. Operational Use - Crew Response - PreEVA: No response, single failure not detectable. EVA: No response, single failure not detectable. Special Training - No training covers this failure mode. Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-12820 defines go/no go criteria related to EMU pressure integrity. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-106 GLOVE ASSEMBLY
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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